

### Remarks

Claims 1-5 and 17-29 were pending. In view of the restriction requirement, claims 2, 4, 24-26 and 28 are cancelled without prejudice to prosecution in a future application. In addition, claims 3, 5, and 23 were amended due to the restriction requirement without prejudice to prosecution in a future application. Claim 29 was added. Therefore, claims 1, 3, 5, 17-23, 27, and 29 are now pending.

Support for the amendments and new claim 29 can be found throughout the specification, for example:

Claim 1: original claim 4 and page 6, lines 11-13.

Claims 3, 5: amendment due to restriction requirement and page 6, lines 11-13.

Claims 18, 20 and 27: page 6, lines 11-13.

Claim 23: amendment due to restriction requirement.

Claim 29: page 14, lines 1-5

Claims 1, 3, 5, 18, 20 and 27 were amended to replace the "one or more" language to "a" in order to clarify that not all of the polypeptides in the compositions need to include SEQ ID NO: 7 (or the sequence specified in the claim). Support for this amendment can be found on page 6, lines 11-13.

### Telephone Interview

Applicants thank Examiner Devi for the courtesy of a telephone interview with Applicants' representative Sheree Lynn Rybak, Ph.D. on July 7, 2004. During this interview, all of the claim rejections were discussed.

It was agreed that the rejection of claim 23 under 35 U.S.C. § 112, first paragraph could be overcome if Applicants presented data in the form of a Rule 132 Declaration demonstrating that variants of the TS-18 peptide had similar biological activity.

Applicants agreed to amend the claims to overcome the rejections under 35 U.S.C. § 112, second paragraph.

In order to overcome the 35 U.S.C. § 102(b) rejection of claims 1 and 20-22 in view of Hubert *et al.*, and the 35 U.S.C. § 102(b) rejection of claims 1, 2 and 27 in view of Tsang *et al.*,

and to overcome all of the 35 U.S.C. § 103(a) rejections, Applicants agreed to amend claim 1 to include a sequence identifier. Examiner Devi agreed that this amendment would overcome these rejections.

The rejection of claims 1-5 and 27 under 35 U.S.C. § 102(a) in view of Greene *et al.* was also discussed. Applicants explained that this rejection was improper as to claims 3 and 5, because Greene *et al.* does not disclose any of SEQ ID NOS: 1-6. Examiner Devi agreed to re-review the Greene *et al.* article. In addition, Applicants explained that Greene *et al.* is not prior art under 35 U.S.C. § 102(a), because it is not the work of another. Applicants agreed to submit a Rule 131 Declaration explaining why Greene *et al.* is not the work of another.

The rejection of claims 1, 4, 5 and 17-21 under 35 U.S.C. § 102(e)(2) in view of Doucette-Stamm *et al.* was also discussed. Applicants requested that the United States Patent and Trademark Office (PTO) provide copies of the corresponding provisional applications (60/085,598 and 60/051,571) in order to determine which date Applicants needed to swear behind to overcome the rejection. In the absence of copies of the corresponding provisional applications (which are not readily available to the Applicants), Applicants and Examiner cannot properly determine the 102(e)(2) date. In the absence of any evidence that Doucette-Stamm *et al.* is entitled to the priority date of the provisional applications, Applicants agreed to file a Rule 131 Declaration swearing behind the June 30, 1998 filing date of the Doucette-Stamm *et al.* patent. In addition, Examiner Devi agreed to determine if she could send us copies of the corresponding provisional applications.

With respect to the Rule 132 Declaration previously filed, Applicants explained that inventor Ryan Greene was unavailable to sign the declaration. Applicants agreed to attempt to have Dr. Greene sign future Declarations.

#### **Declaration under 37 C.F.R. §1.132**

The Office action on page 3 paragraph 5 notes that the Declaration under 37 C.F.R. § 1.132 was not signed by inventor Ryan M. Greene. Inventor Greene was not available at the time the Declaration was prepared, and thus did not sign it. However, Applicants have prepared a new Rule 131 Declaration signed by all of the inventors to overcome the rejection of the application in view of Greene *et al.* (*Mol. Biochem. Parasitol.* 99:257-61, 1999).

### **35 U.S.C. §112, first paragraph**

Claim 23 was rejected under 35 U.S.C. § 112, first paragraph on the ground that the specification is not enabled for TS-18 peptide sequences having one or more conservative substitutions or a fragment thereof. Applicants respectfully disagree and request reconsideration.

As discussed in the enclosed Rule 132 Declaration, Hancock *et al.* (*J. Clin. Microbiol.* 41:2577-86, 2003) demonstrate the ability of TS-18 (SEQ ID NO: 4) peptide variants to immunoreact with *T. solium* antibodies to a similar extent as native TS-18. Figure 1 of Hancock *et al.* shows an alignment of native (GenBank Accession No. AF082828) and variant TS-18 sequences (such as var1 (AF098073), var3 (AF098075), var4 (AF356331) and var 8 (AF356345)) identified in *T. solium* cysts from Peru, Mexico, India, and China. As shown in Figure 1, some of the amino acid residues that differ between native and variant TS-18 sequences are more conservative substitutions (in some examples indicated by two dots, such as K->E and E->D), while others are less conservative (in some examples indicated by one dot, such as K->N and F->L).

Hancock *et al.* demonstrate that all but one of the five variant sequences (var6) have similar biological activity to the native TS-18 sequence. Using immunoassay methods disclosed in the present application (see page 19, line 20- page 21, line 29) and which were known at the time the present application was filed (Hancock and Tsang, *J. Immunol. Methods* 92:167-76, 1986), the immunoreactivity of recombinant TS-18 and its variants to serum containing *T. solium* antibodies was determined. As shown in Figure 4 of Hancock *et al.*, the antibody reactivity of TS-18 and its variants TS-18 var1, var3, var4 and var8 was similar. These four variants had similar J index values (Figure 4). The J index is equal to the sensitivity plus the specificity minus 1.

Because the results shown in Hancock *et al.* demonstrate that peptide sequences having one or more conservative or non-conservative substitutions of SEQ ID NO: 4 immunoreact with *T. solium* antibodies to a similar extent as SEQ ID NO: 4, Applicants request that the 35 U.S.C. § 112, first paragraph rejection be withdrawn.

### **35 U.S.C. §112, second paragraph**

Claims 2-5, 21, 23 and 27 were rejected under 35 U.S.C. § 112, second paragraph on the ground that the claims are indefinite.

Claims 2 and 23 were cancelled, making the rejection moot as to these claims.

Claims 3-4 and 27 were amended to correct the grammar. The claims now read “polypeptide .... comprises”.

Claim 5 has been amended to include the phrase “a nucleotide sequence of” as suggested by the examiner.

Claim 21 has been amended to delete the phrase “or derivatives thereof.”

Claim 23 has been amended to correct the grammar. The claim now reads “SEQ ID NO: 4 comprises.”

In view of these amendments and claim cancellations, Applicants request that the 35 U.S.C. § 112, second paragraph rejections be withdrawn.

### **35 U.S.C. §102**

Claims 1 and 20-22 were rejected under 35 U.S.C. §102(a) as anticipated by Hubert *et al.* (*Clin. Diagn. Lab. Immunol.* 6:479-482, 1999). Although Applicants respectfully disagree, in order to advance prosecution, independent claim 1 has been amended to clarify that the composition includes a peptide that comprises SEQ ID NO: 7. Because Hubert *et al.* do not disclose or suggest SEQ ID NO: 7, claim 1 and its corresponding dependent claims are neither anticipated nor obvious in view of the Hubert *et al.* article. In view of this amendment to claim 1, Applicants request that the 35 U.S.C. §102(a) rejections in view of Hubert *et al.* be withdrawn.

Claims 1, 2, and 27 were rejected under 35 U.S.C. § 102(b) as anticipated by Tsang *et al.* (U.S. Patent No. 5,354,660). Although Applicants respectfully disagree, in order to advance prosecution, independent claim 1 has been amended to clarify that the composition includes a peptide that comprises SEQ ID NO: 7. Because Tsang *et al.* do not disclose or suggest SEQ ID NO: 7, claim 1 and its corresponding dependent claims are neither anticipated nor obvious in view of the Tsang *et al.* patent. In view of this amendment to claim 1 (and the cancellation of claim 2), Applicants request that the 35 U.S.C. §102(b) rejections in view of Tsang *et al.* be withdrawn.

Claims 1-5 and 27 were rejected under 35 U.S.C. § 102(a) as anticipated by Greene *et al.* (*Mol. Biochem. Parasitol.* 99:257-61, 1999). Applicants respectfully disagree and request reconsideration.

The sequence report enclosed with the Office action showing Accession No. Q9U579 (SEQ ID NO: 4) does list Greene *et al.* as a relevant reference. However, Applicants disagree that Greene *et al.* discloses the sequences shown in the present application as SEQ ID NOS: 3 and 4. Neither SEQ ID NO: 3 nor 4 can be found in the Greene *et al.* document. In addition, the record for EMBL Accession No. Q9U579 showing SEQ ID NO: 4 was not created until May 2000, well after the priority date for the present application (August 5, 1999) (see Exhibit C showing a print-out from the TrEMBL database). Therefore, the 35 U.S.C. § 102(a) rejection of claims 3 and 5 in view of Greene *et al.* is improper, and Applicants request that it be withdrawn.

Applicants agree that Greene *et al.* discloses the peptide sequence IAQLAK (SEQ ID NO: 7). However, Greene *et al.* is not the work of another. The present application has four inventors: Greene, Hancock, Tsang, and Wilkins. However, all co-inventors are not inventors of all claims. As discussed in the enclosed Rule 131 Declaration signed by all four inventors, Greene *et al.* discloses subject matter developed by three of the four co-inventors (inventors Greene, Wilkins and Tsang). These three of the four co-inventors were involved in protein purification to obtain sequence fragments of the full-length proteins, including the IAQLAK (SEQ ID NO: 7) fragment of TS-18. Therefore, since Greene, Wilkins and Tsang are co-inventors with respect to claims directed to sequences that include SEQ ID NO: 7 (such as claim 1), the Greene *et al.* manuscript is not citable prior art as to these claims.

Because co-inventor Kathy Hancock was not involved in the protein purification aspect of the project, she was not listed as a co-author of the Greene *et al.* manuscript. Co-inventor Hancock was involved along with the other co-inventors in the recombinant cloning of the full-length sequences claimed in the present invention (such as the TS-18 sequence shown in SEQ ID NOS: 3 and 4). Therefore, Greene, Hancock, Wilkins and Tsang are co-inventors with respect to claims directed to sequences that include SEQ ID NO: 3 and 4 (such as claims 3 and 5).

Because Greene *et al.* does not disclose or suggest the full-length TS-18 nucleotide or peptide sequences shown in SEQ ID NOS: 3 or 4, and because Greene *et al.* is not the work of another with respect to claims directed to sequences that include SEQ ID NO: 7, Applicants

request that the rejection of the claims under 35 U.S.C. § 102(a) in view of Greene *et al.* be withdrawn.

Claims 1, 4, 5 and 17-21 were rejected under 35 U.S.C. § 102(e)(2) as anticipated by Doucette-Stamm *et al.* (U.S. Patent No. 6,583,275). Applicants respectfully disagree and request reconsideration. As discussed in the enclosed Rule 131 Declaration, the present Applicants cloned the amino acid sequence IAQLAK prior to the Doucette-Stamm *et al.* filing date of June 30, 1998. Co-inventors Ryan M. Greene, Victor C. W. Tsang, and Patricia P. Wilkins invented SEQ ID NO: 7 (IAQLAK) prior to June 30, 1998. This is evidenced by peptide sequence data obtained prior to June 30, 1998 from a sample submitted to Harvard MicroChem for sequencing. As shown in Exhibit B, the IAQLAK peptide (represented in our patent application as SEQ ID NO: 7) was sequenced from the sample prior to June 30, 1998.

Applicants have not been able to determine if it is necessary to swear behind the related Doucette-Stamm *et al.* provisional application nos. 60/085,598 filed May 14, 1998, and 60/051,571 filed July 2, 1997. This is because Applicants were not provided with copies of these applications, and the Office action has not met the burden of establishing that Doucette-Stamm *et al.* is entitled to a priority date earlier than the June 30, 1998 date of the non-provisional application. Applicants request that the United States Patent and Trademark Office (PTO) provide copies of the corresponding provisional applications (60/051,571 and 60/085,598) if the PTO intends to assert that these provisional applications disclose the IAQLAK peptide at issue. In the absence of the corresponding provisional applications (which are not readily available to the Applicants), Applicants and the PTO cannot properly determine the 102(e)(2) date. Unless the PTO can demonstrate that the IAQLAK peptide was disclosed in provisional application no. 60/051,571 filed July 2, 1997, or 60/085,598 filed May 14, 1998, Applicants request that the 35 U.S.C. § 102(e)(2) rejection in view of Doucette-Stamm *et al.* be withdrawn since the Office action does not establish a *prima facie* case of anticipation. In the event that the IAQLAK peptide was disclosed in either provisional application no. 60/051,571 or 60/085,598, Applicants request the opportunity at that time to swear behind these references since they were not previously provided.

### 35 U.S.C. §103

Claims 17 and 20-22 were rejected under 35 U.S.C. § 103(a) as unpatenable over Hubert *et al.*, Tsang *et al.*, or Greene *et al.*, as applied to claim 1 further in view of Campbell.

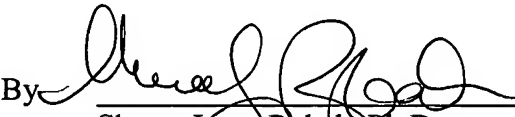
Applicants respectfully disagree and request reconsideration. Claim 1 has been amended to include SEQ ID NO: 7. Since Hubert *et al.* and Tsang *et al.* do not disclose SEQ ID NO: 7, and Greene *et al.* is not prior art to SEQ ID NO: 7 for the reasons discussed above, Claims 17 and 20-22 are not obvious in view of these references. In view of this amendment to claim 1, Applicants request that the 35 U.S.C. §103(a) rejections be withdrawn.

Claims 18 and 19 were rejected under 35 U.S.C. § 103(a) as unpatenable over Hubert *et al.*, Tsang *et al.*, or Greene *et al.*, as applied to claim 1. Applicants respectfully disagree and request reconsideration. Claim 1 has been amended to include SEQ ID NO: 7. Since Hubert *et al.* and Tsang *et al.* do not disclose SEQ ID NO: 7, and Greene *et al.* is not prior art to SEQ ID NO: 7 for the reasons discussed above, Claims 17 and 20-22 are not obvious in view of these references. In view of this amendment to claim 1, Applicants request that the 35 U.S.C. §103(a) rejections be withdrawn.

If any minor issues remain before a notice of allowance is issued, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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